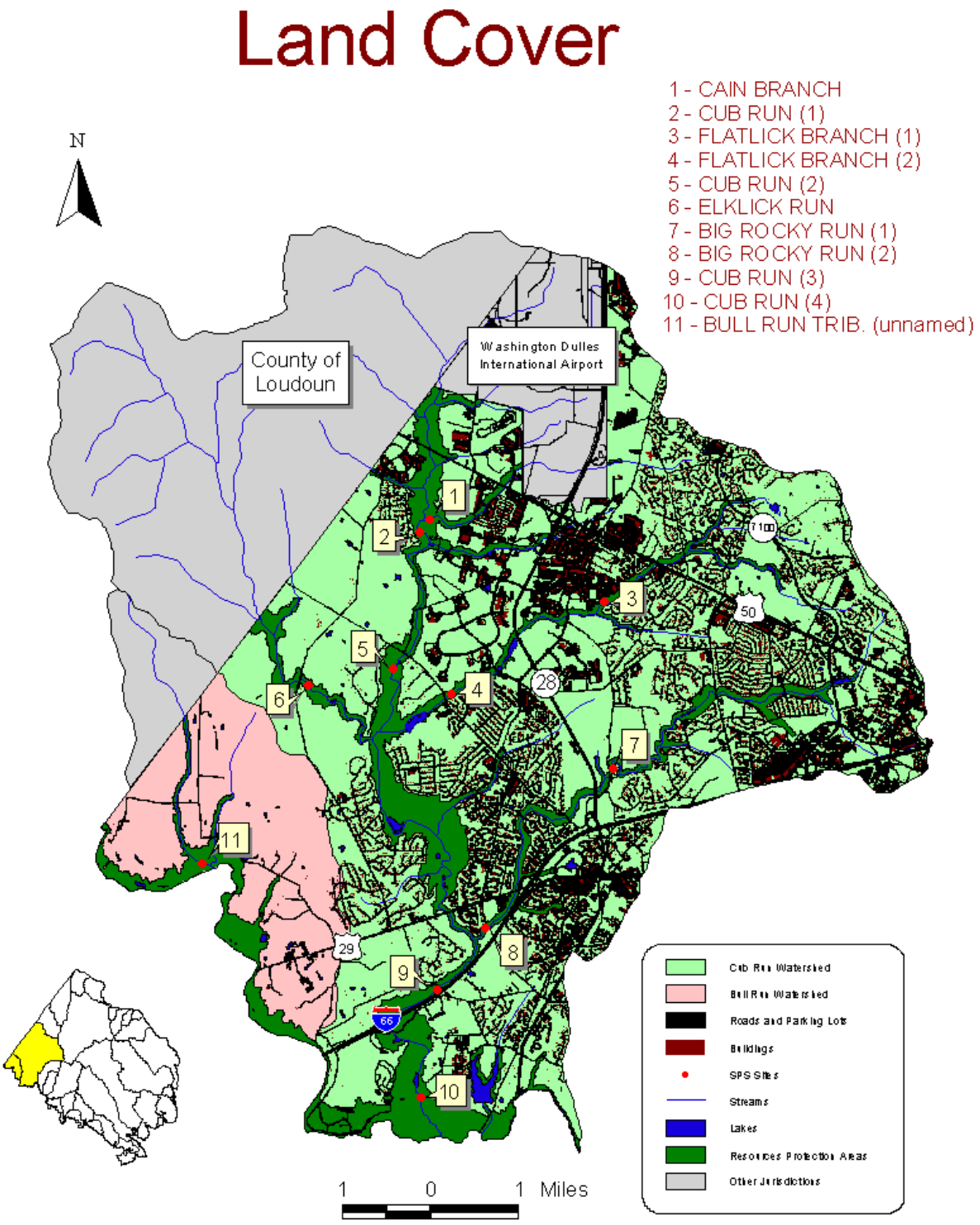
CUB RUN AND BULL RUN WATERSHED SUMMARY


Land Cover
1 - CAIN BRANCH
2 - CUB RUN (1)
3 - FLATLICK BRANCH (1)
4 - FLATLICK BRANCH (2)
5 - CUB RUN (2)
6 - ELKLICK RUN
7 - BIG ROCKY RUN (1)
8 - BIG ROCKY RUN (2)
9 - CUB RUN (3)
10 - CUB RUN (4)
11 - BULL RUN TRIB. (unnamed)
N
County of Loudoun
Washington Dulles International Airport
1
2
3
4
5
6
7
8
9
10
11
7100
50
28
29
66
1 0 1 Miles
Cub Run Watershed
Bull Run Watershed
Roads and Parking Lots
Buildings
SPS Sites
Streams
Lakes
Resources Protection Areas
Other Jurisdictions

CHAPTER 3

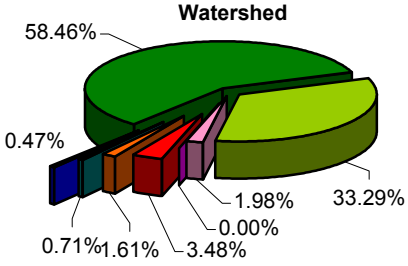
Watershed Description

The Bull Run watershed in Fairfax County is comprised of many small, independent tributaries draining directly into the Bull Run River system, the major source of the Occoquan Reservoir. Only a small portion of its total area is located within Fairfax County, with the remainder contained within the jurisdictions of Loudoun and Prince William Counties. The Fairfax portion of the watershed is mostly undeveloped with levels of imperviousness less than one percent, the lowest in the County.

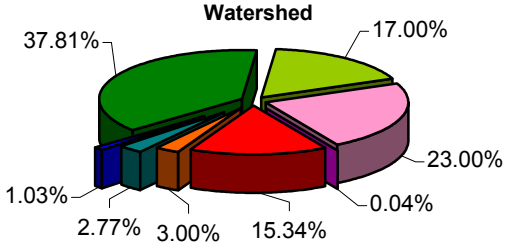
Sections of streams in the Bull Run watershed have extensive riparian buffer zones.

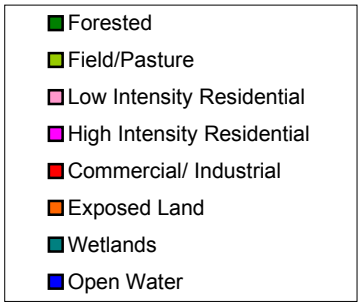
The Cub Run watershed has an area of roughly 55 square miles, with approximately 17 square miles of this area lying outside of Fairfax in Loudoun County and Washington-Dulles International Airport. Like Bull Run, the watershed is located entirely in the Triassic Basin physiographic province. Eleven regional ponds are found within the drainage.

Land Uses in the Fairfax County Bull Run Watershed



Land Uses in the Fairfax County Cub Run Watershed





A variety of land uses are seen within Cub Run, ranging from highly developed urban centers to forest and pastureland. Cub Run has experienced recent growth in housing and commercial areas, mostly in the Centreville area, as suburban development continues to expand westward from Washington, D.C. The western side of the watershed consists of low-density residential communities mixed in with agriculture and forested land.

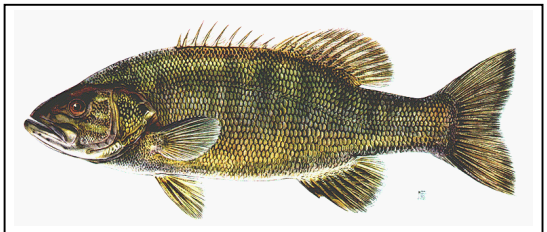
The Cub Run mainstem and its first tributary, Dead Run, begin as a wetland complex on the lightly developed property surrounding Washington-Dulles International Airport. After crossing the Dulles property line into Fairfax County, Cub Run flows for a short distance before increasing its discharge with the addition of Cain Branch, a system that

drains part of Dulles and the residential/commercial area of Chantilly. Cub Run continues south to meet two very different tributaries. Flowing from the east, Flatlick Branch runs through much of the suburban region in and around Chantilly, areas with imperviousness of over 20%. The Elklick Run drainage lies to the west, the 6.5 miles of its mainstem length traveling through lightly developed pasture/agricultural land in Loudoun County, an area with levels of imperviousness averaging under 5%.

Areas of good habitat were common throughout Big Rocky Run in the Cub Run watershed.

Cub Run receives a final input from Big Rocky Run, a system which begins just west of Fair Oaks Mall and flows southwest through the heavily developed suburban areas of Fair Lakes and Centreville. After this confluence, the mainstem runs parallel to, and then crosses under, I-66. For the remainder of its course, Cub Run meanders south through the forested area of Bull Run Regional Park before joining the Bull Run River system on its way to the Occoquan Reservoir.

Largemouth Bass
Micropterus salmoides
Size: to 15 inches or more
Habitat: clear, warm water in ponds, lakes and pools medium/large streams and rivers.
Feeding Group: predator
Tolerance: moderate
This native North American fish has been introduced around the world due to its popularity as a game fish. During spawning, which usually occurs in late spring and early summer, males make and guard large nests. It is not uncommon for largemouth to live past 10 years.



Smallmouth Bass
Micropterus dolomieu
Size: to 20 inches
Habitat: medium/large rivers, gravelly and rocky substrates preferred
Feeding Group: predator
Tolerance: moderate
The Smallmouth Bass is one of the more popular freshwater sport fishes across its range. After spawning in early May, the males will vigorously defend the nests until after the eggs hatch. Larger juveniles and adults primarily feed on crayfishes and fishes but also insects.

Cutlips Minnow
Exoglossum maxillingua
Size: to 6 inches
Habitat: medium/large streams, gravelly and rocky bottoms preferred
Feeding Group: insectivore
Tolerance: intolerant
This minnow is named after the structure of its lower jaw, which is tri-lobed. The center portion is narrow and bony, and is thought that this adaptation might be used for scraping snails and insect larvae from the stream bottom and then crushing them against its upper jaw.

CHAPTER 3

DATA SUMMARY

Stream Name and Site Code	Composite: Site Condition Rating	Environmental Variables: Index of Biotic Integrity	Habitat Score	Fish Taxa Richness	Current Percent Impervious Surfaces	Projected Percent Impervious Surfaces
1 Cain Branch (CUCB01)	Fair	Fair	Poor	Moderate	16.8	51
2 Cub Run (CUCU02)	Good	Good	Fair	Low	8.4	43
3 Flatlick Branch 1 (CUFB01)	Poor	Poor	Poor	High	21.2	39
4 Flatlick Branch 2 (CUFB02)	Poor	Fair	Fair	Low	22.6	49
5 Cub Run 2 (CUCU03)	Good	Poor	Good	Moderate	10.4	46
6 Elklick Run (CUER02)	Fair	Fair	Fair	Very Low	2.2	5
7 Big Rocky Run 1 (CUBR01)	Good	Fair	Excellent	High	27.4	47
8 Big Rocky Run 2 (CUBR02)	Fair	Fair	Fair	Moderate	27.7	44
9 Cub Run 3 (CUCU04)	Poor	Fair	Very Poor	Moderate	12.2	32
10 Cub Run 4 (CUCU05)	Good	Fair	Fair	Moderate	12.0	31
11 Bull Run Tributary (BLBT01)	Excellent	Excellent	Fair	High	0.8	5

Cub Run and Bull Run Fish Species List

Common Name	Number of Sites Where Species Occurred (11 Total Sites)	Common Name	Number of Sites Where Species Occurred (11 Total Sites)
Green Sunfish	11	Fallfish	5
Fantail Darter	10	Creek Chubsucker	4
Redbreast Sunfish	10	Cutlips Minnow	4
Bluegill	10	Common Shiner	4
Swallowtail Shiner	9	Smallmouth Bass	4
Bluntnose Minnow	9	Northern Hogsucker	3
Largemouth Bass	8	Comely Shiner	3
Longnose Dace	8	Blacknose Dace	3
Yellow Bullhead	6	River Chub	2
White Sucker	6	Golden Shiner	2
Tessellated Darter	6	Shield Darter	2
Eastern Mosquitofish	6	Rosyside Dace	1
Satinfin Shiner	6	Gizzard Shad	1
Pumpkinseed	5	Eastern Silvery Minnow	1
Spottail Shiner	5	Margined Madtom	1
Creek Chub	5		

CHAPTER 3

Watershed Condition Summary

In combination, the Cub Run and Bull Run watersheds exhibit a wide range of stream quality conditions, a reflection of the large variations in the intensity of land development seen across their respective drainages.

The fish richness in the two watersheds was relatively high compared to other watersheds in the County. Over 30 fish taxa were found throughout the two basins, with samples for the two lowermost sites on the Cub Run mainstem each yielding 22 distinct taxa. The most notable exception to this pattern was Elklick Run, a system with part of its drainage in Loudoun County, which scored in the very lowest category.

Within the Cub Run basin, many of the benthic macroinvertebrate samples collected were ranked as Fair, indicating a certain level of stream degradation systemwide. Conversely, the Bull Run monitoring site was ranked in the highest category, with almost 30% of the community being comprised of intolerant taxa.

Throughout both drainages, RBP values demonstrated an overall trend toward Fair habitat quality, with many sites showing the impact of substantial sediment deposition and the associated substrate embeddedness. An exception of note was Big Rocky Run in Cub Run, which received the highest ranking for overall quality of instream and riparian zone habitat. This high rating may be due to the fact that Big Rocky Run is protected within the Elanor C. Lawrence Park.

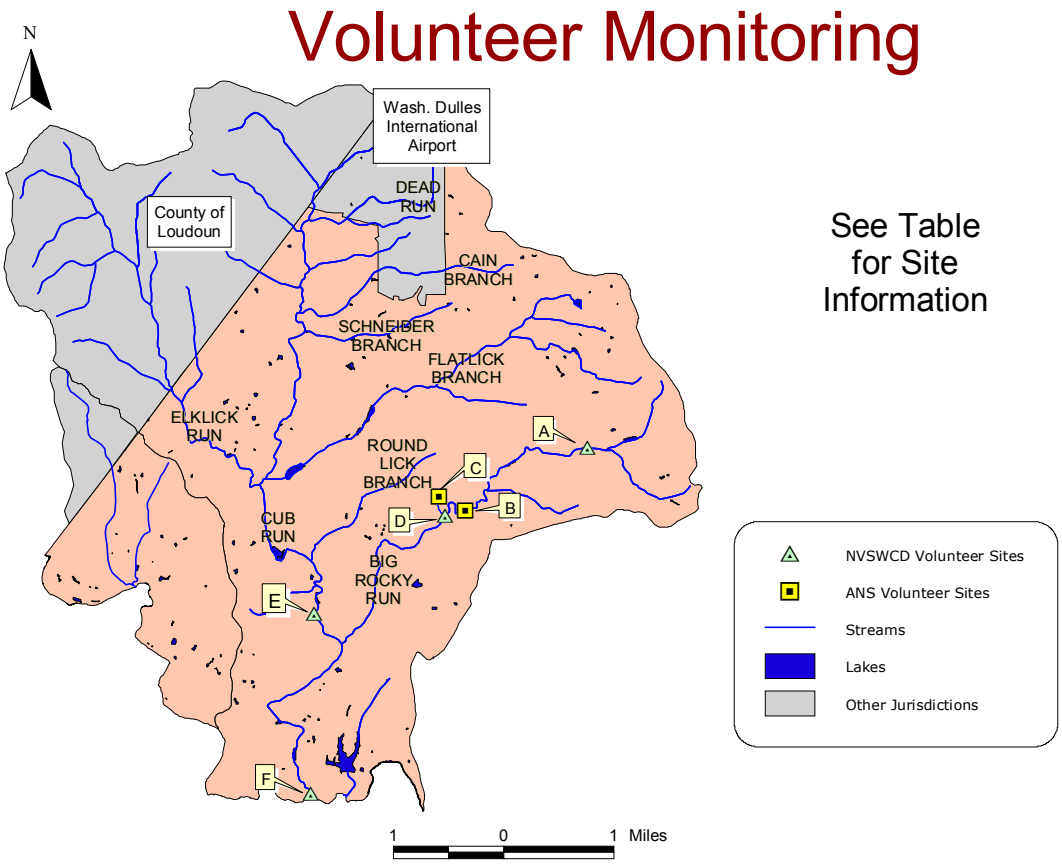
An extremely wide range of imperviousness values (2.2 to 27.7%) exists across the individual subwatersheds of the Cub Run drainage, reflecting both its recent past as farmland and the increasing level of development occurring in its eastern regions. In stark contrast, the Bull Run watershed is almost entirely undeveloped and still exhibits imperviousness values less than one percent. In both cases, the overall site rankings correspond to land use and their biological and habitat components generally decrease along a gradient of increasing development.

Given that the Bull Run basin is uniformly undeveloped in the County, these results serve to further highlight the area's value as a unique resource within Fairfax County. Although some subwatersheds within the Cub Run drainage have been significantly degraded, it also possesses many systems of high quality, including some within areas with high levels of imperviousness that may be just now approaching the threshold for impairment of biological integrity.

CHAPTER 3

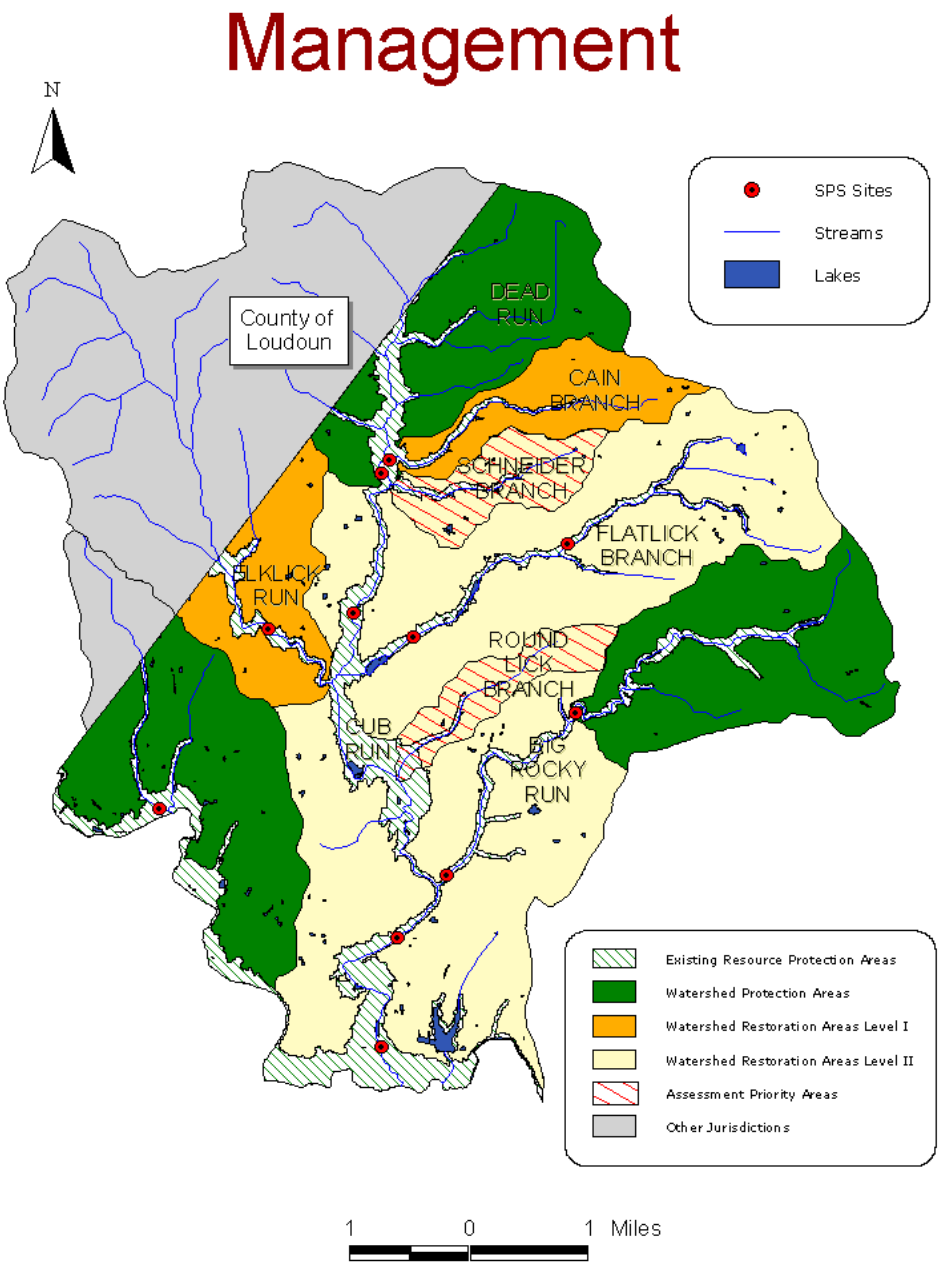
Volunteer Data Summary

There are currently six active volunteer monitoring stations in the Cub Run Watershed. The Northern Virginia Soil and Water Conservation District (NVSWCD) coordinates four, while the remaining two are operated by the Audubon Naturalist Society (ANS). The NVSWCD sites are recent additions to its countywide program.



Both volunteer efforts indicated the presence of relatively diverse communities within many sections of the mainstem, but they differed somewhat in their assessment of the Big Rocky Run tributary. Both NVSWCD sites on Big Rocky Run showed a high quality benthic community, but each has been sampled only once. The ANS site on Big Rocky Run has consistently shown dominance by tolerant taxa. This variation may be caused by local factors or be time-dependent. Continued sampling should resolve the issue.

Letter Code	Site Code	# times sampled	Last sampled	WQR (SOS only)	Trends noted
A	CR4	1	8/26/00	Excellent	Too few samples
B	010	3	11/12/99	N/A	Dominated by tolerant forms
C	009	3	11/11/99	N/A	Many sensitive taxa present, very diverse
D	CR5	1	8/20/00	Good	Too few samples
E	CR1	3	8/12/00	Good	All have been good
F	CR6	1	10/28/00	Good	Too few samples



Management Category Description

Cub Run and Bull Run watersheds represent a gradient of land use types and associated stream quality, which necessitates a range of management alternatives. Headwaters of Cub Run and Bull Run fall into the Watershed Protection category because of their high biological quality; however, both scored low in the habitat assessment, so a closer look at instream habitat restoration is warranted in these areas.

The upper portion of Big Rocky Run is also classified as Watershed Protection, but further research should focus on identifying the factors limiting the biological community.

Both Elklick Run and Cain Branch were classified in the higher priority Watershed Restoration Level I category. Elklick Run has some degree of biological impairment despite low levels of development, and the area warrants further study. Cain Branch received the same priority classification because it flows into the headwaters of Cub Run, a designated Protection Area. The level of imperviousness in the Cain Branch subwatershed is currently slightly above the generally accepted threshold of biological impairment, but this gives us an opportunity to take active measures now before degradation continues.

The remainder of the watershed, including the mainstem, are classified as Watershed Restoration Level II Areas. Some of the lower reaches of the mainstem received a Good ranking, raising the priority of the watershed relative to other drainages in the County. Two smaller tributaries, Schnieder Branch and Round Lick Branch, are highlighted as areas for further study due to lack of information about current conditions in these subwatersheds.

Common Stonefly
Family *Perlidae*
Habitat Classification: clingers
Feeding Group: predators
Tolerance: intolerant
Stoneflies require cool, well oxygenated water to survive, which leads them to be very susceptible to human disturbance. Their bodies are flattened to limit exposure to current flow.